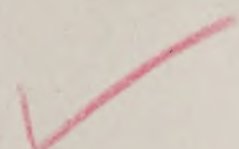


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The University Matriculation Board
Ontario

JUNIOR MATRICULATION

Pass, Honour, and Scholarship.

Regulations and Courses of Study

PRINTED BY ORDER OF
THE LEGISLATIVE ASSEMBLY OF ONTARIO

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UNIVERSITY JUNIOR MATRICULATION

CREATION and POWERS of the UNIVERSITY MATRICULATION BOARD

1.—(1) As a result of a conference of representatives of the University of Toronto; Queen's University, Kingston; McMaster University, Toronto; and the Western University, London, held at the University of Toronto in December, 1908, the Senates of these Universities created "The University Matriculation Board" to conduct and control their annual Matriculation examinations; said Board to be composed of eight members—four appointed by the Senate of the University of Toronto, two by the Senate of Queen's University, and one each by the Senates of McMaster and the Western Universities. The Board was organized on January 27th, 1909. In accordance with the University Statutes creating the University Matriculation Board—(1) This Board appoints the examiners for the Junior Matriculation examinations, regulates the conduct of the examination, considers the reports in connection therewith, and determines the results; and (2) Under this Board the standards and the subjects of the examination papers for Pass and Honour Matriculation are determined by the Statutes and Regulations of the University of Toronto as adopted pursuant to the Annual Conference with the Universities of Ontario represented on the Board.

(2) At the request of the Board, the Department of Education has agreed to provide the same machinery for holding the University Matriculation examinations as it employs for holding the Departmental examinations; but the responsibility for these examinations and the certificates issued devolves wholly on the University Matriculation Board and all communications requiring the attention of the Board should be addressed to the Secretary of the University Matriculation Board, Parliament Buildings, Toronto. It is further agreed that, if at any time the Universities make such a change in the organization and management of their Matriculation examinations as will entail additional expenditure, the consent of the Minister of Education shall be obtained before such expenditure be made a charge on his Department.

REGULATIONS OF THE BOARD.

2.—(1) The Board shall appoint an executive committee of not more than three members who shall, in the intervals between the meetings of the Board, perform such duties as may be assigned to them by the Board.

(2) All communications or references requiring the attention of the Board shall be addressed to the Secretary of the University Matriculation Board.

(3) There shall be two classes of examiners, (a) Examiners-in-chief, who shall set the question papers and read the scholarship and appeal answer papers, and (b) Associate Examiners, who shall read the other answer papers.

(4) The Board shall appoint as Examiners-in-chief persons of well-known ability as teachers in either a University or a High School. No Examiner-in-chief shall be engaged in the preparation of candidates for the examinations concerned.

(5) The Board shall appoint as Associate Examiners persons holding specialists' certificates according to the regulations of the Department of Education, or graduates of any British University. Such persons shall be actually engaged in teaching the subject which they are appointed to examine, and shall have had at least *two* years' successful experience as teachers in this Province.

(6) No Examiner or Associate Examiner shall be appointed for more than three consecutive years, except in the case of an examiner who has exceptional ability for the work and in order to secure the requisite degree of experience in each section.

(7) The number of Examiners-in-chief and Associate Examiners, from year to year, for each examination shall be determined by the Board.

(8) The Examiners-in-chief shall act as a Board, subject to the provisions of "Instructions" No. 7, and shall be jointly responsible for each and every question paper.

(9) The Registrar of the Department of Education shall be Secretary of the University Matriculation Board and Chairman of the Board of Examiners-in-chief and of any committee thereof, and shall perform the duties set forth in Departmental Circular "Instructions" No. 7.

(10) The Board shall appoint a Revising Committee, to consist of not more than three of the Examiners-in-chief, who shall consider the marks obtained by the candidates, make allowances where necessary, determine the results, and report their findings to the Board.

(11) The Board shall print and distribute circulars defining the Course of Study and Regulations governing Pass and Honour Matriculation as authorized by the Senate of the University of Toronto and agreed to by the universities represented on this Board.

(12) If, after all the answer papers have been read, any examination paper should be adjudged by the Board to be easier or more difficult than required, the minimum on the paper shall be correspondingly increased or diminished.

(13) In connection with the Pass Junior Matriculation examination a report signed by all the members of the staff of the school concerned as to the standing of their candidates will be taken into account in determining the results. Only the names of the candidates who, in the opinion of the staff, have completed satisfactorily the courses for the examination shall be included in this report. Such a report must be received at the office of the Secretary not later than the first day of the examination to which the report refers.

(14) A candidate who makes the required aggregate, but who fails to obtain the minimum in a subject, may be passed at the discretion of the Board, provided he was reported by the staff of the school as competent and such report is found to be satisfactory.

(15) Uniform certificates of Pass Junior Matriculation, signed by the Secretary, shall be issued by the Board to successful candidates. These certificates will be accepted by each of the Universities represented on the Board in accordance with the regulations set forth in their respective calendars.

(16) Any candidate may have his papers re-examined on appeal to the Secretary of the Board not later than September 1st. Each appellant shall be charged a fee of \$2.00, which shall be refunded if the appeal is sustained. No appeal, however, against scholarship awards shall be entertained.

(17) Each appeal answer paper shall be read by the Examiner-in-chief who set the paper or by a substitute appointed by the Matriculation Board.

REGULATIONS OF THE UNIVERSITIES.

SUBJECTS.

3.—(1) The subjects of Junior Matriculation are as follows:—Latin, English, History, Mathematics, and any two of the following: Greek, German, French, Experimental Science.

(2) Pass and honour papers will be set in each of these subjects.

(3) In certain cases foreign students may present themselves for examination in their native language instead of Greek or German, or French, but only when the language has been approved by the Senate of the University concerned. The examination in an approved language will consist of two papers, similar in character to those in English.

(4) The maximum marks for each paper is 100.

The pass papers are as follows:

Latin Authors	Greek Authors
Latin Composition	Greek Composition
English Literature	German Authors
English Composition	German Composition
British and Canadian History....	French Authors
Greek and Roman History	French Composition
Algebra	Experimental Science—Physics...
Geometry	Experimental Science—Chemistry.

STANDARDS.

4.—(1) The pass standard is forty per cent. of the marks assigned to a paper, with an average of sixty per cent.

(2) (a) A candidate who has obtained the average of sixty per cent. on all the papers, but has failed to obtain forty per cent. in at most three of these papers, may complete Junior Matriculation by passing on these papers at any one subsequent examination.

(b) A candidate who has obtained 40 per cent. on each of at least eight papers, with an average of 60 per cent. on the same, will be credited with these papers. In order to complete his Matriculation he must obtain, at one subsequent examination, 40 per cent. on each of the remaining papers, with an average of 60 per cent.

(3) A candidate who has obtained partial Matriculation standing under the Regulations in force in a previous year may present himself for examination on the papers necessary to complete his Matriculation.

(4) Other candidates may be admitted to the examination for the purpose of qualifying for a standing other than that of Matriculation.

(5) Candidates who pass the complete examination for Matriculation in any one year will be granted certificates of Pass Junior Matriculation. All other candidates will receive statements of their standing.

(6) The First Class Honour standard is 75 per cent.; the Second Class, 66 per cent.; and the Third Class, 50 per cent. of the marks assigned to the subject. In addition to percentage in the subject a standard of 40 per cent. on each paper is also required.

MIDSUMMER EXAMINATIONS.

5.—(1) Written examinations, as defined above, for Pass and Honour Junior Matriculation will be held by the University Matriculation Board, annually at midsummer, subject to the conditions already stated, at each High School and Collegiate Institute, and at such other centres as may be approved by the Minister of Education. If application is made to the University Senate the examination may, with the co-operation of the Minister of Education, be held at centres outside of Ontario.

(2) Candidates intending to write at any of these examinations at a University shall make application to the Registrar thereof before the 15th of May on an official form to be obtained from him. All other candidates shall make application before the same date to the local Public School Inspector, from whom the official form may be obtained.

(3) Scholarship candidates must also send a special application by the same date to the Registrar of the University concerned according to a form to be obtained from him.

(4) The official form of application shall include the certificate from the Principal of the School from which the candidate comes, or otherwise, that he has read carefully during the preceding year at least four suitable works in English Literature (both prose and poetry), in addition to those prescribed for the examination.

6. The fees for the Midsummer Matriculation examination are as follows:—

Junior Matriculation, \$8.00			
Matriculation standing in certain papers	<table><tr><td>Not more than four, \$3.00.....</td></tr><tr><td>More than four, \$8.00.....</td></tr></table>	Not more than four, \$3.00.....	More than four, \$8.00.....
Not more than four, \$3.00.....			
More than four, \$8.00.....			
Honour Matriculation in certain papers	<table><tr><td>Not more than four, \$5.00.....</td></tr><tr><td>More than four, \$10.00.....</td></tr></table>	Not more than four, \$5.00.....	More than four, \$10.00.....
Not more than four, \$5.00.....			
More than four, \$10.00.....			
Scholarship examination (Matriculation), \$10.00			

SUPPLEMENTAL MATRICULATION EXAMINATION.

7.—(1) The Supplemental Pass Junior Matriculation examination is conducted in September by the University Matriculation Board, at the following centres:—

(a) The University of Toronto; Queen's University, Kingston; McMaster University, Toronto; Western University, London.

(b) Any of the following, upon request:—Windsor, Chatham, Sarnia, St. Thomas, Woodstock, Brantford, Simcoe, Cayuga, Welland, St. Catharines, Hamilton, Goderich, Stratford, Berlin, Guelph, Walkerton, Owen Sound, Orangeville, Barrie, Whitby, Bowmanville, Cobourg, Lindsay, Peterborough, Belleville, Picton, Napanee, Brockville, Kemptville, Prescott, Morrisburg, Cornwall, Alexandria, Vankleek Hill, Ottawa, Smith's Falls, Renfrew, Bracebridge, North Bay, Sault Ste. Marie, Port Arthur, Haileybury.

(c) Elsewhere in Ontario, upon request, and if approved by the University Matriculation Board.

(d) Elsewhere in Canada upon request of one of the aforesaid Universities and with the approval of the Board.

(2) Applications to write on the examination, accompanied by the necessary fee, shall be received at the office of the Secretary of the Board as follows:—

(a) Up to September 1st, from those who wish to write at any centre authorized in Ontario.

(b) Up to August 25th, from those who wish to write elsewhere in Ontario.

(c) Up to August 1st, from those who, through one of the aforesaid Universities, make application to write outside of the Province of Ontario.

(3) On payment of the required fee, with one dollar additional, a candidate who has failed to make application as specified in the foregoing regulation (2) may be admitted to the examination at a centre already established, provided the accommodation is adequate and the number of question papers sufficient.

(4) The subjects of the examination, the prescription of work and the standard required shall be the same as for the Midsummer Pass Junior Matriculation examination of the same year.

(5) The following are eligible to become candidates at this examination:—

(a) Those who are applicants for the complete Matriculation examination.

(b) Those who are completing the Matriculation examination under the regulations in force in any previous year.

(c) Those who are applicants for Matriculation standing in certain papers.

(6) (a) Candidates may write at any one of the four University centres mentioned in (1) (a) without any additional cost to themselves.

(b) Candidates who write at any other centre, in addition to paying the fee required in (7), must also defray the local expenses of conducting the examination. These include the cost of supplies, any charge for the examination room, express charges, and the allowance to the Presiding Officer at \$5 per day.

(7) The fee for writing on the Supplemental examination shall be \$2.00 for each paper, with a maximum fee of \$10.00.

(8) Forms of application and copies of the time-table may be obtained, after July 1st, on application to the Secretary of the Board.

SPECIAL MATRICULATION CONDITIONS.

8.—(1) A candidate who is actually engaged in a mercantile, industrial or other occupation may proceed to pass Junior Matriculation under the following conditions:

(a) He may present himself for one or more subjects at any Mid-summer or September examination.

(b) At any such examination he will receive credit for a subject or subjects on obtaining forty per cent. in each paper and an aggregate of sixty per cent. of the total marks assigned to such subject or subjects. There are two papers given in each subject.

(c) Matriculation must be completed under these conditions within four consecutive years.

(2) In order to secure credit for the subject or subjects written, a candidate who desires to matriculate under these regulations must, immediately on receipt of his statement of marks, return the same to the Secretary of the Board, accompanied by a certificate from his employer to the following effect:—

....., 191..
I, ..., do hereby certify that
..... was in my employ from to
..... in the capacity of, and that
this employment made it impossible for him to attend the regular day
sessions of a secondary school.

My business is that of,
located at

(Give business address in full.)

.....
(Signature in full.)

To the Secretary of the
University Matriculation Board.

(3) Exceptional cases, for which provision is not made under these regulations, will be determined, as they arise, by the University Matriculation Board.

PRESCRIPTION OF WORK.

FOR PASS.

Greek.

Translation into English of passages from the prescribed texts, with questions thereon.

Translation at sight of simple narrative passages similar to the Xenophon prescribed.

Questions on Greek accidence and on the common rules of Greek syntax to test the candidate's accuracy and comprehension in such matters as are needful for the intelligent reading of his texts.

The following are the prescribed texts:—

1913, 1915: Xenophon, Philpotts and Jerram, Easy selections from Xenophon, chaps. 3, 4, and 5; Homer, Iliad, I., 1-350.

1914: Xenophon, Philpotts and Jerram, Easy selections from Xenophon, chaps. 3, 4, 5; Homer, Iliad, VI., 66-118 and 237 to the end.

Two papers will be set: (1) Prescribed texts; (2) translation at sight, accidence and syntax.

Latin.

Translation at sight of passages of average difficulty from Cæsar, upon which special stress will be laid.

Translation, with questions, from a prescribed portion of Virgil's *Æneid*.

The marks assigned for the translation from prescribed authors shall not be more than twenty-five per cent. of the total marks assigned to the Latin papers.

Questions on Latin accidence.

Translation into Latin of English sentences involving a knowledge of the following principles of Latin syntax: The common uses of the cases; the accusative with the infinitive; the subjunctive in simple sentences; final and result clauses; the law of the sequence of tenses; the indirect question; verbs of fearing, doubting and hindering; the use of the participle, gerund and gerundive, active and passive periphrastic; indirect discourse; and the common forms of the conditional sentence.

The vocabulary will be taken from the prescribed portion of Cæsar and special stress will be laid upon this part of the examination.

Examination upon a short prescribed portion of Cæsar, to test the candidate's knowledge of Latin syntax, and the power of idiomatic translation.

The following are the texts prescribed:—

1913: Cæsar, *De Bello Gallico*, Book IV., chaps. 20-38, and Book V., chaps. 1-23; Virgil, *Æneid*, Book II., vv. 1-505.

1914, 1915: Cæsar, Book IV., chaps. 20-38, and Book V., chaps. 1-23; Virgil, *Æneid*, Book I., vv. 1-510.

Two papers will be set: (1) Translation at sight, Virgil, and accidence. (2) Translation into Latin, syntax and idiomatic translation from prescribed Cæsar, etc.

English.

COMPOSITION: An essay on one of several themes set by the examiners. In order to pass in this subject, legible writing, correct spelling and punctuation, and idiomatic and grammatical construction of sentences are indispensable. The candidate should also give attention to the structure of the whole essay, the effective ordering of the thought, and the active employment of a good English vocabulary. About two pages of foolscap is suggested as the proper length for the essay; but quality, not quantity, will be mainly regarded.

One examination paper.

LITERATURE: The candidate will be expected to have memorized some of the finest passages. Besides questions to test the candidate's familiarity with, and comprehension of, the following selections, questions may also be set to determine within reasonable limits his power of appreciating literary art.

The candidate shall produce satisfactory proof, by the certificate of the principal of the school from which he comes or otherwise that he has read carefully, during the preceding year, at least four suitable works in English literature (both prose and poetry) in addition to those prescribed below for examination.

One examination paper.

1913: Tennyson, *The Lotus Eaters*, *Ulysses*, "You ask me, why," "Of old sat Freedom," "Love thou thy land," *Locksley Hall*, "Tears, idle tears," and the six interlude songs from *the Princess*, *The Brook*, *Ode on the Duke of Wellington*, *Charge of the Light Brigade*, *Enoch Arden*; Shakespeare, *Julius Cæsar*.

1914: Tennyson, *The Lady of Shalott*, *St. Agnes' Eve*, "Come not when I am dead," "Break, break, break," *In the Valley of Caunteretz*, *Elaine*; Browning, *All Service Ranks the Same with God*, *My Last Duchess*, *Cavalier Tunes*, *The Boy and the Angel*, *Love among the Ruins*, *Home Thoughts from Abroad*, *Up at a Villa*, *The Guardian Angel*, *Prospice*, Shakespeare, *Macbeth*.

1915: Wordsworth, *Michael*, *Influence of Natural Objects*, *Nutting*, *Elegiac Stanzas*, *To the Rev. Dr. Wordsworth*, *To the Cuckoo*, "Bright flower! whose home," and the following eight sonnets:—"It is not to be thought of," "Dark and more dark the shades of evening fell," "O friend, I know not," "Milton thou shouldst," "Surprised by joy—impatient as the wind," "Hail twilight, sovereign of our peaceful hour," "I thought of thee, my partner and my guide," "Such age how beautiful"; Tennyson, *The Epic and Morte d'Arthur*, *Oenone*, *The Brook*, and the following selections of *In Memoriam*: XXVII., LXIV., LXXXIII., LXXXVI., CI., CXIV., CXV., CXVIII., CXXIII.; Shakespeare, *Merchant of Venice*.

German.

The candidate's knowledge of German will be tested by: (1) simple questions on grammar; (2) the translation of simple passages from English into German; (3) translation at sight of easy passages from modern German, and (4) an examination on the following texts:—

The texts contained in the *New High School German Reader*.

1913: Seidel, *Aus goldenen Tagen*, edited by W. Bernhardt.

1914: Arnold, *Fritz auf Ferien*.

1915: Wildenbruch, *Der Letzte*.

Two papers will be set: (1) Prescribed texts and translation at sight; questions on grammar; (2) the translation of English into German.

French.

The candidate's knowledge of French will be tested by: (1) simple questions on grammar; (2) the translation of simple passages from English into French; (3) translation at sight of easy passages from modern French, and (4) an examination on the following texts:—

The texts contained in the New High School French Reader.

1913: Labiche, *le Voyage de Monsieur Perrichon*.

1914: Daudet, *la belle Nivernaise*.

1915: Labiche, *la Poudre aux yeux*.

Two papers will be set: (1) Prescribed texts and translation at sight; questions on grammar; (2) the translation of English into French.

History.

Great Britain and Canada from 1763 to 1885, with the outlines of the preceding periods of British and Canadian history.

The geography relating to the history prescribed.

One examination paper.

General outlines of Greek history to the fall of Corinth.

General outlines of Roman history to the death of Augustus.

The geography relating to the history prescribed.

One examination paper.

Mathematics.

ALGEBRA.—Elementary Rules; highest common measure; lowest common multiple; fractions; square root; simple equations of one, two and three unknown quantities; indices; surds; quadratics of one and two unknown quantities.

One examination paper.

GEOMETRY.—A.—CONSTRUCTIONS.

To construct a triangle with sides of given lengths.

To construct an angle equal to a given rectilineal angle.

To bisect a given angle.

To bisect a given straight line.

To draw a line perpendicular to a given line from a given point in it.

To draw a line perpendicular to a given line from a given point not in the line.

Locus of a point equidistant from two given lines.

Locus of a point equidistant from two given points.

To draw a line parallel to another, through a given point.

To divide a given line into any number of equal parts.

To describe a parallelogram equal to a given triangle, and having an angle equal to a given angle.

To describe a parallelogram equal to a given rectilineal figure, and having an angle equal to a given angle.

On a given straight line to describe a parallelogram equal to a given triangle, and having an angle equal to a given angle.

To find the centre of a given circle.

From a given point to draw a tangent to a given circle.

On a given straight line to construct a segment of a circle containing an angle equal to a given angle.

From a given circle to cut off a segment containing an angle equal to a given angle.

In a circle to inscribe a triangle equiangular to a given triangle.

To find locus of centres of circles touching two given lines.

To inscribe a circle in a given triangle.

To describe a circle touching three given straight lines.

To describe a circle about a given triangle.

About a given circle to describe a triangle equiangular to a given triangle.

To divide a given line similarly to another given divided line.

To find the fourth proportional to three given lines.

To describe a polygon similar to a given polygon, and with the corresponding sides in a given ratio.

To find the mean proportional between two given straight lines.

To construct a polygon similar to a given polygon, and such that their areas are in a given ratio.

To describe a polygon of a given shape and size.

B.—Theorems.

The sum of the angles of any triangle is equal to two right angles.

The angles at the base of an isosceles triangle are equal, with converse.

If the three sides of one triangle be equal, respectively, to the three sides of another, the triangles are equal in all respects.

If two sides and the included angle of one triangle be equal to two sides and the included angle of another triangle, the triangles are equal in all respects.

If two angles and one side of a triangle be equal to two angles and the corresponding side of another, the triangles are equal in all respects.

If two sides and an angle opposite one of these sides be equal, respectively, in two triangles, the angles opposite the other pair of equal sides are either equal or supplemental.

The sum of the exterior angles of a polygon is four right angles.

The greater side of any triangle has the greater angle opposite it.

The greater angle of any triangle has the greater side opposite it.

If two sides of one triangle be equal respectively to two sides of another, that with the greater contained angle has the greater base, with converse.

If a transversal fall on two parallel lines, relations between angles formed, with converse.

Lines which join equal and parallel lines towards the same parts are themselves equal and parallel.

The opposite sides and angles of a parallelogram are equal and the diagonal bisects it.

Parallelograms on the same base, or on equal bases, and between the same parallels are equal.

Triangles on the same base, or on equal bases, and between the same parallels are equal.

Triangles equal in area, and on the same base, are between the same parallels.

If a parallelogram and a triangle be on the same base, and between the same parallels, the parallelogram is double the triangle.

Expressions for area of parallelogram, and the area of a triangle.

The complements of parallelograms about the diagonal of any parallelogram are equal.

The square on the hypotenuse of a right-angle triangle is equal to the sum of the squares on the sides.

If a straight line be divided into any two parts, the sum of the squares on the parts, together with twice the rectangle contained by the parts, is equal to the square on the whole line.

The square on a side of any triangle is equal to the sum of the squares on the two other sides + twice the rectangle contained by either of these sides and the projection of the other side on it.

If more than two equal straight lines can be drawn from the circumference of a circle to a point within it, that point is the centre.

The diameter is the greatest chord in a circle, and a chord nearer the centre is greater than one more remote. Also the greater chord is nearer the centre than the less.

The angle at the centre of a circle is double the angle at the circumference on the same arc.

The angles in the same segment of a circle are equal, with converse.

The opposite angles of a quadrilateral inscribed in a circle are together equal to two right angles, with converse.

The angle in a semicircle is a right angle; in a segment greater than a semicircle less than a right angle; in a segment less than a semicircle greater than a right angle.

A tangent is perpendicular to the radius to the point of contact; only one tangent can be drawn at a given point; the perpendicular to the tangent at the point of contact passes through the centre; the perpendicular from centre on tangent passes through the point of contact.

If two circles touch, the line joining the centres passes through the point of contact.

The angles which a chord drawn from the point of contact makes with the tangent, are equal to the angles in the alternate segments.

The rectangles under the segments of intersecting chords are equal.

If $OA \cdot OB = OC^2$, OC is a tangent to the circle through A , B and C .

Triangles of the same altitude are as their bases.

A line parallel to the base of a triangle divides the sides proportionally, with converse.

If a vertical angle of a triangle be bisected, the bisector divides the base into segments that are as the sides, with converse.

The analogous proposition when the exterior angle at the vertex is bisected, with converse.

If two triangles are equiangular, the sides are proportional.

If the sides of two triangles are proportional, the triangles are equiangular.

If the sides of two triangles about equal angles are proportional, the triangles are equiangular.

If two triangles have an angle in each equal, and the sides about two other angles proportional, the remaining angles are equal or supplemental.

Similar triangles are as the squares on corresponding sides.

The perpendicular from the right angle of a right-angled triangle on the hypotenuse divides the triangle into two which are similar to the original triangle.

In equal circles angles, whether at the centres or circumferences, are proportional to the arcs on which they stand.

The areas of two similar polygons are as the squares on corresponding sides.

If three lines be proportional, the first is to the third as the figure on the first to a similar figure on the second.

Questions and easy deductions on the preceding constructions and theorems.

It is recommended that the study of formal demonstrative Geometry be preceded by a course in Practical Geometry, extending over not more than a year, and embracing the following:—

Definitions; fundamental geometric conceptions and principles; use of simple instruments, as compasses, protractor, graduated rule, etc.; measurement of lines and angles, and construction of lines and angles of given numerical magnitude; accurate construction of figures; some leading propositions in plane geometry reached by induction as a result of accurate construction of figures; deduction also employed as principles are reached and assured. At the examination, questions may be given in Practical Geometry, the constructions being such as naturally spring from the prescribed course. Candidates must provide themselves with a graduated ruler, compasses, set-square and protractor.

In the formal deductive Geometry modifications of Euclid's treatment of the subject will be allowed, though not required, as follows:—

The employment of the "hypothetical construction."

The free employment of the method of superposition, including the rotation of figures about an axis, or about a point in a plane.

A modification of Euclid's parallel postulate.

A treatment of ratio and proportion restricted to the case in which the compared magnitudes are commensurable.

One examination paper.

Experimental Science.

CHEMISTRY.—Physical and chemical changes. Elements, compounds, mixtures, and solutions. Fundamental chemical laws and principles, as definite proportions, multiple proportions, constancy of mass, and equivalence. Rate of chemical reaction and the conditions that affect it. Avogadro's hypothesis and its applications. Ionization in solution. Properties of acids, bases, and salts. Types of chemical re-

actions, as oxidation, reduction, replacement, neutralization of acids and bases, catalytic action. Combination in solutions.

The practical study of the following elements and their more important compounds for the purpose of learning their chemical properties and relationships, illustrating the laws and principles of Chemistry, and learning something of the commercial and industrial uses and preparation of materials derived from them:

Hydrogen, Oxygen, Sulphur, Sodium, Potassium, Nitrogen, Chlorine, Bromine, Iodine, Carbon, Calcium, Strontium, and Barium.

Quantitative Exercises throughout the course.

One examination paper.

PHYSICS.

An experimental course defined as follows:

Heat.

Nature and sources of heat; thermometers; maximum density of water; relation between volume and the temperature of a gas (Charles' Law); absolute temperature; change of state; latent heat; specific heat; mechanical equivalents of heat; transmission of heat.

Sound.

Vibrations: Transversal vibrations, illustrated with pendulums, rods, strings, membranes, plates; longitudinal vibrations illustrated with rods, strings, and columns of air. The use of the manometric flame. Production, propagation, and detection of sound waves. Velocity of sound, pitch; standard forks (acoustical C = 512, musical A = 870). Intervals; harmonic scale; diatonic scale; equally tempered scale. Vibration of air in organ pipes; nodes and loops in vibrating air columns and in vibrating strings; wave lengths and velocity relations. Laws of vibration of strings; interference phenomena; beats; resonance; reflection and absorption of sound.

Light.

The ether, the wave theory of light, rectilinear propagation, image through a pin hole, beam, pencil; photometry; shadow and grease spot photometers; reflection and scattering of light; laws of reflection, images in plane mirrors, multiple images in inclined mirrors, concave and convex mirrors, critical rays; drawing images, refraction, laws and index of refraction; total reflection; path through a prism; lenses; drawing image produced by a lens by use of critical rays. Simple microscope; dispersion and colour; spectrum; recombination of light; projection lantern.

Electricity.

Magnetism; laws of magnetic attraction and repulsion; magnetic lines of force; phenomena of induction; inclination and declination of

the compass. Production and detection of electricity. Electrical conductors and insulators; electroscopes and their construction; electrical conduction through air; radioactivity illustrated by means of uranium and thorium salts. Electrical conduction in liquids; electrolysis; electroplating and electrotyping. Voltmeters, storage and voltaic cells; electrical condensers; condensing electroscopes; simple notions of potential; Ohm's Law; electrical units; galvanometers and voltmeters; laws of resistance; divided circuits; experimental determination of current strength, resistance and electromotive force; current induction and its general laws; the transformer, the induction coil, dynamo, telephone, motor, ether waves, Röntgen rays, and wireless telegraphy.

One examination paper.

FOR HONOURS.

Greek.

Translation into English of passages from the prescribed texts, with questions thereon.

Translation at sight of prose passages of average difficulty from Xenophon's historical works.

Translation into Greek of sentences (based upon Xenophon's vocabulary) to test the candidate's scholarship in matters of accidence, syntax and phraseology.

The following are the prescribed texts:—

1913, 1914: Xenophon, *Hellenica* (Philpotts' Selections, sections I. and II.), Homer, *Iliad* I., 1-350; III., 121-244; VI., 66-118, and 237 to the end; *Odyssey* VI. and IX.

Two papers will be set: (1) prescribed texts; (2) translation at sight and Greek prose composition.

Latin.

Translation into English of passages from prescribed texts.

Translation at sight of passages of average difficulty from Cæsar.

Grammatical questions on the passages from prescribed texts and such other questions as arise naturally from the context.

Translation into Latin of English sentences to illustrate Latin syntax and continuous passages of English, based on Cæsar.

The following are the prescribed texts:—

Cæsar, *De Bello Gallico*, Book I.; Horace, *Odes*, Book I., 1, 2, 5, 6, 10, 14, 22, 24, 31, 34, 35, 38; Book II., 3, 10, 14, 15, 16, 18; Book III., 1, 2, 3, 4, 5, 13, 21, 23, 24, 25, 29, 30; Book IV., 2, 4, 5, 7, 15.

1913: Virgil, *Æneid*, Book I., vv. 1-510 or Book II., vv. 1-505, or *Georgics*, Book IV.; Cicero, *Pro Lege Manilia*.

1914, 1915: Virgil, *Æneid*, Book I., vv. 1-510, or Book II., vv. 1-505; Cicero, *In Catilinam* I. and III.

Two examination papers: (1) Latin prose; (2) authors and sight translation.

English.

COMPOSITION: An essay of one of several themes set by the examiners.

One examination paper.

LITERATURE: Such questions only will be set as may serve to test the candidate's familiarity with, and intelligent and appreciative comprehension of, the prescribed texts. The candidate will be expected to have memorized some of the finest passages. In addition to the questions on the prescribed selections others will be set on a "sight passage" to test the candidate's ability to interpret literature for himself.

The candidate shall produce satisfactory proof by the certificate of the principal of the school from which he comes or otherwise that he has read carefully, during the preceding year, at least four suitable works in English literature (both prose and poetry) in addition to those prescribed below for examination.

One examination paper.

1913: Tennyson, *The Lotus Eaters*, *Ulysses*, "You ask me, why," "Of old sat Freedom," "Love thou thy land," *Locksley Hall*, "Tears, idle tears," and the six interlude songs from *the Princess*, *The Brook*, *Ode on the Duke of Wellington*, *Charge of the Light Brigade*, *Enoch Arden*; Shakespeare, *Julius Cæsar*, *Midsummer Night's Dream*.

1914: Tennyson, *The Lady of Shalott*, *St. Agnes' Eve*, "Come not when I am dead," "Break, break, break," *In the Valley of Caunteretz*, *Elaine*; Browning, "All Service Ranks the Same with God," *My Last Duchess*, *Cavalier Tunes*, *The Boy and the Angel*, *Love among the Ruins*, *Home Thoughts from Abroad*, *Up at a Villa*, *The Guardian Angel*, *Prospice*, *Cavalier Tunes*; Shakespeare, *Macbeth*, *As You Like It*.

1915: Wordsworth, *Michael*, *Influence of Natural Objects*, *Nutting*, *Elegiac Stanzas*, *To the Rev. Dr. Wordsworth*, *To the Cuckoo*, "Bright flower! whose home," and the following eight sonnets:—"It is not to be thought of," "Dark and more dark the shades of evening fell," "O friend, I know not," "Milton thou shouldst," "Surprised by joy—impatient as the wind," "Hail twilight, sovereign of our peaceful hour," "I thought of thee, my partner and my guide," "Such age how beautiful"; Tennyson, *The Epic and Morte d'Arthur*, *Oenone*, *The Brook*, and the following selections of *In Memoriam*:—XXVII., LXIV., LXXXIII., LXXXVI., CI., CXIV., CXV., CXVIII., CXXIII.; Shakespeare, *Merchant of Venice*, *Henry IV., Part I.*

German.

The prescription of work in grammar, the translation of English into German and sight translation, is the same for honours as for pass, but the examination will be of a more advanced character.

The following are the prescribed texts:—

1913: Isolde Kurz, *Die Humanisten*; Fulda, *Unter vier Augen*; Benedix, *Der Prozess*; German Poems, edited by Burkhard (Henry Holt and Co.).

1914: Moser, *Der Bibliothekar*; Ebner-Eschenbach, *Krambambuli*; Heyse, *L'Arrabbiata*.

1915: Four German plays, ed. Manley and Allen (Ginn and Co.), Heyse, *Das Mädchen von Treppi*.

French.

The prescription of work in grammar, the translation of English into French and sight translation, is the same for honours as for pass, but the examination will be of a more advanced character.

The following are the prescribed texts:—

1913: Souvestre, *un philosophe sous les toits*, Feuillet, *la Fée*.

1914: Feuillet, *Roman d'un jeune homme pauvre*.

1915: Halévy, *l'Abbé Constantin*.

History.

General outline of mediæval and modern European history, with special reference to British history.

The geography relating to the history prescribed.

Two examination papers.

Mathematics.

ALGEBRA: Elementary rules; highest common measure; lowest common multiple; fractions; square root; simple equations of one, two and three unknown quantities; indices, surds, quadratics of one and two unknown quantities; theory of divisors; ratio, proportion and variation; progressions; notation; permutations and combinations; binomial theorem; interest forms; annuities.

One examination paper.

TRIGONOMETRY.—Trigonometrical ratios with their relations to each other; sines, etc., of the sum and difference of angles with deduced formulas; use of logarithms; solution of triangles; expressions for the area of triangles; radii of circumscribed, inscribed and escribed circles.

One examination paper.

PROBLEMS: One paper.

GEOMETRY: A.—Exercises on the course prescribed for the pass examination, with special reference to the following topics:—loci; maxima and minima; the system of inscribed, escribed and circumscribed circles of a triangle, with metrical relations; radical axis.

B.—The following additional propositions in Synthetic Geometry, with exercises thereon:—

To divide a given straight line internally and externally in medial section.

To describe a square that shall be equal to a given rectilineal figure.

To describe an isosceles triangle having each of the angles at the base double of the third angle.

To inscribe a regular pentagon in a given circle.

The squares on two sides of a triangle are together equal to twice the square on half the third side and twice the square on the median to that side.

If $A B C$ be a triangle, and A be joined to a point P of the base such that $B P : P C = m : n$, then $n A B^2 + m A C^2 = (m + n) A P^2 + n B P^2 + m P C^2$.

In a right-angled triangle the rectilineal figure described on the hypotenuse is equal to the sum of the similar and similarly described figures on the two other sides.

If the vertical angle of a triangle be bisected by a straight line which also cuts the base, the rectangle contained by the sides of the triangle is equal to the rectangle contained by the segments of the base, together with the square on the straight line which bisects the angle.

If from the vertical angle of a triangle a straight line be drawn perpendicular to the base, the rectangle contained by the sides of the triangle is equal to the rectangle contained by the perpendicular and the diameter of the circle described about the triangle.

The rectangle contained by the diagonals of a quadrilateral inscribed in a circle is equal to the sum of the two rectangles contained by its opposite sides.

Two similar polygons may be so placed that the lines adjoining corresponding points are concurrent.

If a straight line meet the sides $B C$, $C A$, $A B$, of a triangle $A B C$ in D , E , F , respectively, then $B D \cdot C E \cdot A F = D C \cdot E A \cdot F B$, and conversely. (Menelaus' Theorem.)

If straight lines through the angular points A , B , C of a triangle are concurrent, and intersect the opposite sides in D , E , F , respectively, then $B D \cdot C E \cdot A F = D C \cdot E A \cdot F B$, and conversely. (Ceva's Theorem.)

If a point A lie on the polar of a point B with respect to a circle, then B lies on polar of A .

Any straight line which passes through a fixed point is cut harmonically by the point, any circle, and the polar of the point with respect to the circle.

In a complete quadrilateral each diagonal is divided harmonically by the two other diagonals, and at the angular points through which it passes.

C.—ELEMENTARY ANALYTICAL GEOMETRY: Axes of co-ordinates. Position of a point in plane of reference.

Transformation of co-ordinates—origin changed, or axes (rectangular) turned through a given angle.

$$\pm 2A = x_1(y_2 - y_3) + \dots + \dots$$

Co-ordinates of point dividing line joining $P_1(x_1, y_1)$ and $P_2(x_2, y_2)$, in ratio $m : n$ are

$$x = \frac{mx_2 + nx_1}{m + n}, \quad y = \frac{my_2 + ny_1}{m + n}.$$

$$(P_1 P_2)^2 = (x_1 - x_2)^2 + (y_1 - y_2)^2$$

Equations of straight lines.

$$\left. \begin{aligned} \frac{x - x_1}{x_1 - x_2} &= \frac{y - y_1}{y_1 - y_2} \\ \frac{x}{a} + \frac{y}{b} &= 1. \end{aligned} \right\} \begin{array}{l} \text{Line defined by two points} \\ \text{through which it passes.} \end{array}$$

$$\left. \begin{aligned} \frac{x - a}{\cos \theta} &= \frac{y - b}{\sin \theta} = r. \\ y &= mx + b. \\ y &= m(x - a). \\ x \cos \alpha + y \sin \alpha &= p. \end{aligned} \right\} \begin{array}{l} \text{Line defined by one point} \\ \text{through which it passes.} \\ \text{and by its direction.} \end{array}$$

General equation of 1st degree, $Ax + By + C = 0$, represents a straight line.

Any line through (x_1, y_1) is

$$A(x - x_1) + B(y - y_1) = 0.$$

If θ be angle between $Ax + By + C = 0$ and $A'x + B'y + C' = 0$, then

$$\tan \theta = \frac{A'B - AB'}{AA' + BB'}.$$

Condition of $\perp$ rity, $AA' + BB' = 0$.

Condition of $\parallel$ ism, $\frac{A}{A'} = \frac{B}{B'}$.

Distance from (a, b) to $Ax + By + C = 0$, in direction whose direction cosines are (l, m) , is

$$-\frac{Aa + Bb + C}{Al + Bm}.$$

$\perp$ distance from (a, b) on $Ax + By + C = 0$, is

$$\pm \frac{Aa + Bb + C}{\sqrt{A^2 + B^2}}.$$

THE CIRCLE—

Equations in forms :

$$x^2 + y^2 = r^2.$$

$$(x - a)^2 + (y - b)^2 = r^2.$$

$$x^2 + y^2 - 2rx = 0.$$

$$\text{General equation } x^2 + y^2 + 2Ax + 2By + C = 0$$

$$\text{or } (x + A)^2 + (y + B)^2 = A^2 + B^2 - C$$

represents a circle with centre $(-A, -B)$ and radius $\sqrt{A^2 + B^2 - C}$.

Tangent at (x', y') to $x^2 + y^2 = r^2$ is $xx' + yy' = r^2$.

Normal is $\frac{x}{x'} = \frac{y}{y'}$.

Tangent in form $y = mx \pm r\sqrt{1 + m^2}$.

Pole being (x', y') , polar is $xx' + yy' = r^2$.

If pole move along a line, polar turns about pole of that line.

Square of tangent from (x', y') to $x^2 + y^2 + 2Ax + 2By + C = 0$

$$\text{is } x'^2 + y'^2 + 2Ax' + 2By' + C.$$

Radical axis of $x^2 + y^2 + 2Ax + 2By + C = 0$,

$$x^2 + y^2 + 2A'x + 2B'y + C' = 0.$$

Easy exercises on the preceding propositions.

One examination paper.

Physics.

1. MECHANICS: Measurement of velocity; uniformly accelerated rectilinear motion; metric units of force; work, energy, and power. Momentum; energy, force and momentum relations; equilibrium of forces acting at a point; triangle, parallelogram, and polygon of forces; parallel forces; principle of moments; centre of gravity; laws of friction; numerical examples.

2. PROPERTIES OF MATTER: An experimental course illustrating the following topics:—Constitution of solids, liquids, gases; energy; transmutation of energy; conservation of energy; kinetic theory of matter. Boyle's and Charles' Laws; Avogadro's hypothesis. Heat, a mode of motion; absolute temperature; mechanical equivalent of heat.

Fluid pressure at a point; pressure on a horizontal plane, pressure on an inclined plane, resultant vertical pressure and resultant horizontal pressure, when liquid is under air pressure and when it is not; transmission of pressure; Bramah press; equilibrium of liquids in contact; with calculations relating to the preceding.

The barometer, Isobars, weather forecasting. The siphon. Surface tension phenomena; surface energy illustrated with applications to filtration; dyeing, and agricultural problems. Flow of liquids—Torricelli's theorem, Bernoulli's theorem; variation of pressure with velocity of flow of liquid, with application to atomisers, Bunsen filter pumps, aspirators, forced draughts, ball-nozzles, and curves of a baseball or golf-ball.

One examination paper.

Chemistry.

Reactions, rates of reactions, reversible reactions, chemical equilibrium. The practical study of the following elements with their most characteristic compounds, having regard to Mendelejeff's classification of the elements, and some of the most important economic and industrial applications: hydrogen, sodium, potassium, magnesium, zinc, calcium, strontium, barium, boron, aluminium, carbon, silicon, tin, lead, nitrogen, phosphorus, arsenic, antimony, bismuth, oxygen, sulphur, fluorine, chlorine, bromine, iodine, manganese, iron, copper, nickel. A report must be furnished showing the amount and nature of the laboratory work done by each candidate, and the teacher's opinion of his proficiency.

One examination paper.

Biology.

ZOOLOGY.—The practical study of the external form and of the prepared skeleton of the various types prescribed. Prepared dissections may be used to supplement class dissection. Drawing by the pupils of their dissections is a necessary part of the course.

The Fish: Any one of the common fresh water fishes of Ontario; special attention to the organs of locomotion, circulation, respiration. As several species are easily obtainable, this class may be employed for studying the principles of zoological nomenclature.

The Frog: Comparison with the fish as to the organs above mentioned. Observation of the development of the spawn of one or more Amphibia.

The Reptile: A turtle and a snake. Comparison of both with a lizard.

The Bird: Special attention to the plumage, the bill and feet, and the modifications of the skeletal, muscular, and respiratory systems in connection with aerial life. Study of birds in relation to agriculture.

The Mammal: Characters of the chief domesticated and wild mammals of Ontario, as well as the main facts of internal structure of one of the smaller forms (*e.g.*, the rabbit or cat). Comparison of the teeth and feet of the pig, horse, sheep, rabbit, dog, mole, bat.

The crayfish as a type of the arthropods. Comparison of the external form of the crayfish with that of an insect (*e.g.*, grasshopper, cricket, cockroach), also with that of a millipede and a spider. Insects injurious to vegetation; the methods of combating their attacks.

Unsegmented and segmented worms (*e.g.*, a planaria and an earth worm).

Fresh-water mussel and snail.

A fresh-water unicellular animal, such as an amoeba or paramecium.

The natural habits of the various animals studied in relation to their structure.

A general view of classification based upon comparisons of the types studied.

NOTE.—Models are desirable for demonstration purposes.

One examination paper.

Botany.—The practical study of representatives of the flowering plants of the locality in which the school is situated, and representatives of the chief subdivisions of cryptogams, such as a fern, a lycopod, a horsetail, a liver-wort, a moss, a lichen, a mushroom, a chara, and a spirogyra—with a general view of classification. An elementary knowledge of the microscopic structure of the bean and the maize or other types of the dicotyledons and monocotyledons. Drawings and descriptions of parts of plants, and classification. Comparison of different organs; morphology of root, stem, leaves, hair, parts of the flower; reproduction of flowering plants, pollination, fertilization and the nature of fruits and seeds. Laboratory course in plant physiology, with studies of protoplasm, osmosis, absorption of food material; culture fluids, transpiration, digestion, respiration, growth, and movement. Common economic fungi (a collection to be made) with further study of fungous diseases.

One examination paper.

